

## CLAIMS

What is claimed is:

1. A particle shield, comprising:
  - 2 a plurality of flexible shield layers;
  - 3 a resilient support layer between adjacent ones of the flexible shield layers;
  - 4 a protective cover configured to enclose the flexible shield layers; and
  - 5 fasteners associated with the protective cover and capable of releasably securing
  - 6 the flexible shield layers to a structure to be protected.
  
- 1 2. The particle shield of claim 1, wherein the support layer includes a space  
2 qualified open-cell foam.
  
- 1 3. The particle shield of claim 1, wherein the support layer includes a space  
2 qualified closed-cell foam.
  
- 1 4. The particle shield of claim 3, wherein each cell of the closed-cell foam  
2 contains a predetermined low pressure gas.
  
- 1 5. The particle shield of claim 1, wherein the support layer includes a  
2 ceramic foam.

1           6. The particle shield of claim 1, wherein the support layer has one or more  
2 portions removed therefrom.

1           7. The particle shield of claim 1, wherein the fasteners include one or more  
2 Velcro™ fasteners.

1           8. The particle shield of claim 1, wherein the fasteners include one or more  
2 snap fasteners.

1           9. The particle shield of claim 1, wherein the fasteners include one or more  
2 straps.

1           10. The particle shield of claim 1, wherein at least one of the flexible shield  
2 layers is made of a ceramic fabric.

1           11. The particle shield of claim 1, wherein at least one of the flexible shield  
2 layers is made of a high-strength fabric.

1           12. The particle shield of claim 1, further comprising at least one thermal  
2 insulation layer.

1        13. The particle shield of claim 1, wherein the protective cover is made of an  
2        abrasion resistant material that has an absorptivity to emissivity ratio selected to provide  
3        a predetermined level of thermal protection.

1        14. The particle shield of claim 1, wherein the protective cover is vented.

2        15. The particle shield of claim 1, wherein the protective cover is flame  
3        retardant.

4        16. The particle shield of claim 1, wherein the protective cover is optically  
5        reflective or absorptive.

6        17. A protection system against hypervelocity particles, comprising:  
7        means for shocking the impacting hypervelocity particles to thereby substantially  
8        fragment or vaporize the hypervelocity particles;  
9        means for supporting the shocking means in a resilient manner;  
10        means for enclosing the shocking means in a cover layer; and  
11        means for securing the shocking means on a structure to be protected.

1        18. The protection system of claim 17, further comprising means for reducing  
2        a size and volume occupied by the protection system.

1           19. The protection system of claim 17, further comprising means for  
2 deploying the shocking means on a structure to be protected.

1           20. The protection system of claim 17, further comprising means for thermally  
2 insulating the shocking means.

1           21. The protection system of claim 17, further comprising means for  
2 substantially venting gas particles produced by the impact of the hypervelocity particles.

1           22. The protection system of claim 17, further comprising means for  
2 substantially containing debris produced by the impact of the hypervelocity particles.

1           23. A method of protecting against hypervelocity particles using a flexible  
2 multi-shock shield, the method comprising:

3           reducing a size and volume occupied by the flexible multi-shock shield;  
4           transporting the flexible multi-shock shield to a desired location;  
5           expanding the flexible multi-shock shield to its initial size and volume;  
6           securing the flexible multi-shock shield on a structure to be protected; and  
7           shocking the hypervelocity particles with the flexible multi-shock shield.

1           24. The method of claim 23, further comprising conforming the flexible  
2 multi-shock shield to a surface of the structure to be protected.

1        25. The method of claim 23, further comprising releasing the flexible  
2 multi-shock shield from the structure to be protected.

1        26. The method of claim 23, further comprising stowing the reduced volume  
2 flexible multi-shock shield in a storage location.

1        27. A hypervelocity particle shield, comprising:  
2            a plurality of spaced apart flexible shield layers, at least one of which is made of a  
3            flexible ceramic fabric;  
4            a resilient support layer between adjacent ones of the flexible shield layers, the  
5            resilient support layer including at least one space qualified foam layer;  
6            at least one thermal insulation layer disposed on the plurality of flexible shield  
7            layers;  
8            a vented, abrasion resistant protective cover configured to enclose the flexible  
9            shield layers and having an absorptivity to emissivity ratio selected to provide a  
10           predetermined level of thermal protection; and  
11           fasteners attached to the protective cover and capable of releasably securing the  
12           flexible shield layers to a structure to be protected.

1        28. The hypervelocity particle shield of claim 27, wherein the space qualified  
2           foam layer includes an open-cell foam layer.

1           29. The hypervelocity particle shield of claim 27, wherein the space qualified  
2       foam layer includes a closed-cell foam layer, each cell therein containing a predetermined  
3       low-pressure gas.

1           30. The hypervelocity particle shield of claim 27, wherein the support layer  
2       further includes a ceramic foam layer.

1           31. The hypervelocity particle shield of claim 27, wherein the support layer  
2       has one or more portions removed therefrom.

1           30. The hypervelocity particle shield of claim 27, wherein the fasteners  
2       include one or more snap fasteners.

1           31. The hypervelocity particle shield of claim 27, wherein the fasteners  
2       include one or more straps.

1           32. The hypervelocity particle shield of claim 27, wherein the fasteners  
2       include at least one Velcro™ fastener.